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should be as infrequent and as brief as possible.

A Cramer 'crown' plate placed in a printing frame under a thin or fast printing positive, will yield a negative picture when held for one second at a distance of three meters from a 16-candle incandescent lamp. The exposure may be gradually increased to an exposure of an hour at a distance of one meter from a 300-candle Packard incandescent lamp. How much longer the exposure may be is not yet known. All exposures up to three and a half minutes at a distance of one meter from the 300-candle lamp can be developed as fine negatives in the dark room. This last exposure may also be developed as a positive in light somewhat feebler than direct midwinter sunlight in St. Louis. With greater exposures, the illumination of the light room must be decreased, in order to obtain the best results. With the highest exposures producing developable results, the plate must be developed in the dark room.

The actinic values over this vast range are now being measured. The plates as developed are laid in proper position upon a series of large tables, about 40 feet in length. The coordinate values determining the position of the plate upon the tables are, exposure and illumination of the developing room.

The point which it is desired to urge in this communication is, that in the coming eclipses of this year and next, there is no need of losing any plates from over-exposure, even if they are exposed during the entire time of totality. It is hoped that this communication will cause those who are to take part in that work to lose no time in becoming familiar with the possibilities of development in a bath such as has been here described.

This communication has been prematurely published in order to direct the attention of those who are to take part in the

observations of the next eclipse to a matter which may have great importance. It may be that some of the statements may require modification. For example, it is perhaps questionable whether exposure in a printing frame at a distance of a meter from a 300-candle lamp for three and a half minutes is an over-exposure of 2,000 times.* It is certainly a very great over-exposure.

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*THE PROBABLE SUCCESSORS OF CERTAIN
NORTH AMERICAN PRIMATES.*

THE credit for the discovery of the affinities of the fossil Primates of the Eocene deposits of this country have been variously claimed by both Marsh and Cope. Leidy, however, appears to have clearly preceded both these investigators in this respect in his 'Vertebrate Fauna of the Territories,' published in 1873. In this work, in describing the lower jaw of *Northarctus tenebrosus*, a fossil monkey from the Bridger Eocene, he makes the following significant remarks: "In many respects the lower jaw of *Northarctus* resembles that of some of the existing American monkeys quite as much as it does that of any of the living pachyderms. *Northarctus* agrees with most

*Since writing the above it has been found that potassium bromide will do all that has been done with hypo as above described. The earlier failures in the use of bromide were due to insufficient quantity. In developing some good pictures near the zero condition a ten-per-cent. solution of bromide has formed a sixth of the bath. The bromide pictures are somewhat more brilliant, but do not seem so sharp and hard as some obtained by hypo. It may safely be stated that any camera exposure, from the shortest possible, to those lasting for hours, may be developed into a good picture. When the exposure is too great for development in the dark room as negatives, the plate may be as successfully treated in the light room and developed as a positive. A plate which will develop as a beautiful positive in the light of a 16-candle lamp, will develop a foggy mongrel picture, partly positive and partly negative in a perfectly dark room.

of the American monkeys in the union of the rami of the jaw at the symphysis, in the small size of the condyle, in the crowded condition of the teeth, and in the number of the incisors, canines and true molars which are also nearly alike in constitution. *Northarctus* possesses one more premolar and the others have a pair of fangs. The resemblance is so close that but little change would be necessary to evolve from the jaw and teeth of *Northarctus* that of a modern monkey. The same condition which would lead to the suppression of the first premolar, in continuance would reduce the fangs of the other premolars to a single one. This change with a concomitant shortening and increase in the depth of the jaw would give the characters of a living *Cebus*."

In studying the rich collections of this Primate material in the Yale Museum, I have been forcibly struck with the accuracy and wisdom of Leidy's comparison. Not only does it appear to me that there is a decided resemblance between these extinct North American forms and the living South American Cebidæ, but I am firmly of the opinion that the one was the direct descendant of the other. This proposition I find is sustained by a number of trenchant osteological facts which I hope to fully elucidate in my forthcoming publication on the subject.

While they may in general be said to be in a corresponding stage of evolution to that of the living Lemurs, they nevertheless belong to a separate and distinct phylum. This phylum detached itself from the main Primate stem far back in early Tertiary time. When the tropical forests receded to the southward of the land bridge which connected Asia with North America during practically the whole of the Tertiary, the interchange of species which were dependent upon this tropical vegetation was no longer possible, and at this point began the development of the two phyla, one of which

terminated in the Old World monkeys and man and the other the flat-nosed monkeys of the New World.

In the earlier half of the Middle Eocene or Wasatch these monkeys were abundant in northern Wyoming. During the deposition of the Bridger beds or first stage of the Upper Eocene, we find them in southern Wyoming, where they may be said to have reached their culmination, so far, at least, as numbers and variety are concerned. We are at liberty to infer from much collateral evidence that this region was at that time intensely tropical and was highly suited to their manner of life, since some of the more common species are represented by remains of thousands of individuals in the collections. Towards the close of the Bridger, however, premonitions of the coming changes began to make themselves felt, probably first in the altered character of the vegetation. These were of such a nature as to cause another retreat to the southward, which must have been more rapid, since in the succeeding Unita or uppermost Eocene stage we find but a few stragglers of the hardier and more abundant species left behind. Such, however, soon disappear, and with this record, so far, at least, as our knowledge at present extends, their history on the North American continent closes. It is a highly significant fact that in the succeeding Oligocene and Miocene deposits the remains of monkeys are wholly absent, in the northern latitudes, at least, where they were formerly so abundant. The only conclusion we can draw from this is that the tropical vegetation had receded to the south, and taken with it all the inhabitants dependent upon it.

We next hear of these Primates in the Miocene beds of Patagonia, showing clearly that they had not only reached the South American continent at that time in their southward peregrinations, but that they had spread themselves quite to its extreme south-

ernmost limits. This fact argues strongly for a pre-Miocene land bridge between North and South America, just as the North American ancestry of the Edentata, as I have already pointed out, calls for a similar explanation. Had the conditions been favorable, and the southern barriers been sufficient to arrest further progress, we could believe that through stress of environment a much higher type of monkey, and possibly a man, might have been evolved in the Western Hemisphere in the manner so ingeniously suggested by Duncan. But as it is the Cebidae represent the highest expression of Simian development which has ever been attained on this continent.

J. L. WORTMAN.

YALE UNIVERSITY MUSEUM,
January 23, 1901.

AMERICAN PSYCHOLOGICAL ASSOCIATION.

THE ninth annual meeting of the Association was held in Baltimore, December 27 and 28, 1900, in affiliation with the American Society of Naturalists. The President of the Association, Professor Joseph Jastrow, was in the chair, and on the afternoon of the 27th delivered the presidential address. At the business meeting held the same afternoon, Professor Josiah Royce was elected President of the Association for the ensuing year, and Professors J. Mark Baldwin and John Dewey were elected members of the Council for terms of three years. Several matters of interest were discussed at the business meeting. An invitation from President Harper to hold the next annual meeting at the University of Chicago was received and after full discussion it was voted unanimously that the invitation be accepted, power being given to the Council to arrange for the meeting.

A committee of five was appointed to consider the question of undertaking in part the publication of Dr. J. H. Leuba's proposed catalogue of psychological litera-

ture and to report at the next meeting of the Association.

A resolution was adopted that the Committees of Arrangements of Foreign Congresses of Psychology be requested to confer with the American Psychological Association with regard to the American representation at such congresses and the participation of American members in their proceedings.

Sessions for the reading of papers were held on the morning of the 27th and on both the morning and the afternoon of the 28th.

Professor Jastrow's presidential address was upon 'Currents and Undercurrents in Psychology.*' The speaker took up in turn various aspects of modern psychology. After discussing the significance of the evolutionary conception of the science, he spoke of the three-fold mode of approach, viz., the genetic, the normal and the abnormal, to many of its problems as being productive of interesting and valuable advance, and outlined the advantages and limitations of each aspect. The contemporary interest in certain functional complexes, notably reading and writing was noticed and the whole question of the practical bearing of psychology was discussed, the speaker assuming a conservative position in the matter.

At the first session on Thursday morning, Mr. Robert M. Yerkes, of Harvard, read a paper on 'Habit Formation and Memory in Invertebrates and Lower Vertebrates.' This was a preliminary report of some experimental studies in animal psychology now being conducted in the Harvard Laboratory. The chief purposes of the work are (1) to determine to what extent, with what rapidity, and precisely how, animals learn; (2) to test the permanency of any associations formed and (3) to make as many supplementary observations on the

* Published in full in the *Psychological Review* for January, 1901.